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Anti-obesity composition

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ANTI-OBESITY COMPOSITION

TECHNICAL FIELD OF THE INVENTION

The present invention relates to the use of a proteinaceous material for the manufacture of a composition for preventing and/or treating obesity as well as for improving the lipid metabolism. Also provided herein is the cosmetic use of said proteinaceous material for improving the body appearance and composition thereof.

BACKGROUND OF THE INVENTION

Obesity may be a risk factor that causes various adult diseases such as diabetes type 2 and cardiovascular diseases including hypertension. It may also be a cause for deteriorating these diseases. Still, adults are not the sole category of persons concerned with the problem of obesity. Hence, currently, about one fourth of children and 1 in 2 adults are overweight in the USA, prevalence rates that have increased by 50% since the 1960s. The obesity in children has been associated with consumption of sugar-sweetened drinks.

Lipid metabolism disorders is also one complication of obesity which is often characterised by an hyperinsulinaemia, an elevated apolipoprotein B, the presence of small dense LDL, a high LDL cholesterol concentration, a high triglycerides concentration as well as a low HDL cholesterol concentration.

Thus, early therapeutic and/or preventive treatment of obesity has become highly desired.

Further, with the trend of healthy eating, has also emerged the trend of being fit or stay lean. Accordingly, not only persons affected by obesity are concerned with the problem of controlling or losing weight but also healthy persons having a desire to stay lean.

A healthy person, that is a person not suffering from obesity, also might have a desire to lose weight in order to obtain a cosmetically acceptable appearance.

Accordingly, with the control or loss of weight becoming a growing concern of the human population, this has resulted in a growing area of research within the scientific field.

Recently, Jequier E. in "Pathways to obesity" Int J Obes Relat Metab Disord 2002;26(suppl):2:S12-7 concluded that the prevalence of obesity had reached epidemic proportions in affluent societies, thereby indicating that the primary cause of obesity was more lying in environmental and behavioural changes than in genetic modifications. Among the environmental influences, the fat energy percentage of the everyday diet and the lack of physical activity were described as two important factors, contributing to explain the rising prevalence of obesity.

Up to now, the overcoming of this problem has been variously solved such as by use of medication. However, a problem encountered with the use of medication is their efficiency in the long term, i.e. after 3 months where patients seem to reach a plateau as far as loss of weight is concerned or the medication does not perform its role of diminishing the satiety feeling, so that patients regain weight. Still, another problem with the use of medication is the potential for side effects which sometimes outweigh the benefit of taking the medication.

Accordingly, the research field has also been active in finding a more natural solution. The simplest natural solution is to exercise. However, to obtain a noticeable result, exercising on a regular basis is a pre-requisite which is, with today's trends of habits, not always achievable.

Remedies by consumption of low-fat diets have indicated mitigated results. Hence, most short-term studies on low-fat diets show that they induce a modest weight loss in obese individuals. In contrast with short-term trials, longer term trials, that is trials lasting for more than a year in individuals randomly assigned to diets with a lower percentage of energy from fat, appeared to have little if any effect on body fatness.

Many low fat commercial food products now exist that derive a low percentage of energy from fat and a high percentage of carbohydrate according the low-fat-high-carbohydrate diet phase I diet as recommended by the American Hearth Association (AHA). And although on population base, the reported percentage of dietary energy derived from fat has fallen in recent years, the prevalence of obesity has continued to increase, suggesting at the least that fat may be only one of several determinants of overeating. So, diets high in fat do not appear to be the primary cause of the high prevalence of excess body fat in our Western society, and reductions in fat will not be a solution according to Willett WC in " Is dietary fat a major determinant of body fat?" Am J Clin Nutr 1998;67(suppl):556S-62S.

This suggests that other dietary factors may play a critical role in body weight regulation. One such factor may be the glycaemic index. The concept of glycaemic index (GI) was proposed by Jenkins DJ, Wolever TM, Taylor RH, Barker HM, Fielden H, Baldwin JM , Bowling AC, Newman HC, Jenkins AL & Goff DV. "Glycemic index of foods: a physiological basis for carbohydrate exchange". Am J Clin Nutr 1981;34:362–366, to characterize the rate of carbohydrate absorption after a meal. The GI is defined as the area under the glucose response curve after consumption of 50 g carbohydrate from a test food divided by the area under the curve after consumption of 50 g carbohydrate from a control food, either white bread or glucose. Many factors together, including carbohydrate type, fibre, protein, fat, food form and method of preparation, determine the GI of a particular food.

Lately, a new method of dieting called the "Montignac method" has been described. This method involves the balancing administration of protein and carbohydrate. In particular, the Montignac method is an *ad libitum* low GI-low fat-high-protein diet in which menus are designed so that carbohydrates with a glycaemic index above 55 are excluded. Many factors together, including carbohydrate type, fiber, protein, fat, food form and method of preparation, determine the GI of a particular food. Moreover, according to this method, during meals in which significant amounts of fat are consumed next to carbohydrates with low GI, proteins can be served at any time and indiscriminately with either fats or carbohydrates. However, while the method has demonstrated efficient results, people have found it difficult to follow the method on a

long-term basis, especially once the weight loss is obtained. As a result, the benefits obtained are often lost within a few weeks after stopping with the method.

It has now been found that the use of a specific proteinaceous material and composition thereof provides a natural solution to the problem of losing weight as well as to the problem of lipid metabolism. This effect is especially seen upon long term use of the proteinaceous material or composition thereof.

Advantageously, it has been found that the use of this proteinaceous material also prevents the degradation of muscle tissue by stimulation of fat oxidation instead of using muscle protein as an energy source so that the level of exertion is such that the metabolic energy for the muscles is still predominantly obtained from fat-oxidation. This is particularly shown upon exercising.

SUMMARY OF THE INVENTION

In one aspect of the invention, there is provided the use of a proteinaceous material for the manufacture of a composition for preventing and/or treating human obesity, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

In another aspect of the invention, there is provided the use of a proteinaceous material for the manufacture of a composition for reducing in humans the LDL cholesterol concentration and/or reducing triglycerides concentration and/or increasing the HDL cholesterol concentration, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

In another aspect of the invention, there is provided the use of a proteinaceous material for the manufacture of a composition for preventing muscle degradation, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

In another aspect of the invention, there is provided the use of a proteinaceous material for the manufacture of a composition for stimulating the oxidation of fat, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

In another aspect of the invention, there is provided the cosmetic use of a proteinaceous material for stimulating and/or improving body weight reduction in order to improve the human body appearance, wherein the proteinaceous material is a non-mammalian protein hydrolysate.

In a further aspect of the present invention is provided a nutritional composition comprising a non-mammalian proteinaceous material and a carbohydrate, wherein the proteinaceous material is a protein hydrolysate and wherein the weight ratio of the proteinaceous material to the carbohydrate is greater than 1.

DETAILED DESCRIPTION OF THE INVENTION

A-proteinaceous material

A proteinaceous material is an essential element of the present invention. Indeed, the use of this ingredient has been found beneficial for patients suffering from obesity but also for healthy persons wanting to stay lean. Accordingly, the use of this ingredient has been found effective in the prevention and treatment of human obesity. Advantageously, the use of this ingredient has also be found to provide amelioration to the lipid metabolism by reducing in humans the LDL cholesterol concentration and/or reducing the triglycerides concentration and/or increasing the HDL cholesterol. Preferably, the amelioration has been provided by amelioration of the three parameters, namely by reducing in humans the LDL cholesterol concentration and reducing the triglycerides concentration and increasing the HDL cholesterol.

Yet, another group of persons has found benefit from using this ingredient, namely the healthy persons having a desire to stay lean. Accordingly, the use of this ingredient has

been found to stimulate and/or improve the body weight reduction in healthy persons, thereby improving the human body appearance. By "healthy persons", it is meant persons not suffering from obesity.

Advantageously, upon exercising of this group of persons as well as for obese persons, it has been found that prevention of the muscles degradation can be obtained by use of the proteinaceous material of the present invention. This is achieved by a stimulation of fat oxidation when the level of exertion is such that the metabolic energy for the muscles is still predominantly obtained from fat-oxidation.

The proteinaceous material, for the purpose of the invention use, are non-mammalian protein hydrolysates.

By "non-mammalian proteins", it is meant proteins that are not provided from mammalian sources. Accordingly, non-mammalian proteins include proteins from the non-limiting sources: vegetable proteins, fungal proteins, microbial proteins, fish proteins, poultry proteins, egg proteins, as well as mixtures thereof.

By "protein hydrolysate", it is meant that the protein raw material is hydrolysed by one or more hydrolytic enzymes. The hydrolytic enzyme can be of animal, plant, yeast, bacterial or fungal origin. Preferably enzyme preparations are used which have a low exo-peptidase activity to minimise the liberation of free amino acids and to improve taste profiles of the protein hydrolysates. The preferred hydrolysed protein material of the present invention has an average peptide chain length in the range of 2-40 amino acid residues and more preferably in the range of 3-20 amino acid residues. The average peptide chain can be determined using the method as described in WO 96/26266. The protein hydrolysates that can be used to prepare a composition as disclosed in the present invention are not limited to ones disclosed in the present invention but include all protein hydrolysates that can be obtained by enzymatic hydrolysis using common techniques as described in the literature and known to those skilled in the art.

Non-mammalian protein hydrolysates for use herein are hydrolysates of protein obtained from non-mammalian protein selected from vegetable proteins, fungal proteins, microbial proteins, fish proteins, poultry proteins, egg proteins, and mixtures thereof.

Vegetable protein hydrolysates are hydrolysates of vegetable protein obtained from protein selected from wheat, maize, pea, rice, soy, yeast, barley, oats, potato, and mixtures thereof, more preferably is a pea protein hydrolysate.

Non-mammalian protein hydrolysates have been found advantageously effective for use herein. Indeed, it has been found that with non-mammalian protein hydrolysates, the composition obtained was more palatable than the composition made with high amounts of intact protein, i.e. raw protein.

For the purpose of the present invention, the vegetable protein hydrolysates are preferred. Indeed, it has been found that the vegetable protein hydrolysate, preferably the pea protein hydrolysate, best influenced the weight reduction in obese people on a hypocaloric diet without them losing muscle tissue.

The proteinaceous ingredient is preferably incorporated in a composition comprising one or more materials, herein after described and selected from at least one member of the class consisting of carbohydrates, intact proteins (both mammalian and non-mammalian), free amino acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof. Preferably, the composition comprises a carbohydrate, more preferably together with materials selected from at least one member of the class consisting of intact non-mammalian proteins, mammalian proteins, free amino acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof.

When incorporated in a composition, the proteinaceous material is present in an amount of at least 10% by dry weight of the composition.

B-Composition

A nutritional composition is another essential aspect of the present invention. Accordingly, the invention composition encompasses two essential elements: a proteinaceous material and a carbohydrate.

1)-Proteinaceous material

A proteinaceous material is an essential element of the invention composition. The proteinaceous material, for the purpose of the invention composition, is a non-mammalian protein hydrolysate as hereinbefore defined.

When incorporated in the invention composition, the proteinaceous material is present in an amount of at least 10% by dry weight of the composition.

Not to be bound by theory, it is believed that consumption of proteinaceous material and/or composition of the present invention only provides a limited effect on the insulin secretion upon a carbohydrate load, thereby promoting the gradual losing of weight. Surprisingly, it has also been found that upon dieting with the invention compared to a higher carbohydrate content diet, the plasma lipid profile was changed into an even less atherogenic profile meaning that the LDL fraction was lowered, the HDL fraction enhanced and the triglyceride fraction lowered.

2)-Carbohydrate

A carbohydrate is also an essential element of the invention composition. Indeed, by precisely selecting the type of carbohydrate, it was found that the insulin response, believed to be responsible for either the loss of muscle or gain of weight, was neglectable, even after a few weeks of dieting with the invention use/composition.

Accordingly, the carbohydrate of the invention is advantageously selected from at least one member of the class consisting of:

a)-a rapidly absorbed fraction comprising components selected from glucose, sucrose, one or more rapidly absorbed disaccharides containing a glucose unit, and mixtures thereof;

b)- a moderately absorbed fraction comprising components selected from one or more moderately absorbed monosaccharides, disaccharides, glucose-containing polysaccharides, and mixtures thereof;

c)- a slowly absorbed fraction comprising components selected from one or more slowly absorbed glucose-containing polysaccharides.

As used herein, the term "rapidly absorbed" means glucose and disaccharides which contribute directly to elevation in blood glucose ,e.g., maltose, and sucrose; the term "moderately absorbed" means mono- and disaccharides, e.g., fructose and mannose, that do not contribute directly to elevation of blood glucose and those polysaccharides, both soluble and insoluble (e.g., starches), containing at least 30 molar % glucose units that release a majority of their glucose upon incubation in pancreatic amylase and amyloglucosidase at 37°C. in 20 minutes or less as described by Cummings and Englyst AJCN 61 (Suppl):938S-945S; the term "slowly absorbed" means those polysaccharides containing at least 30 molar % glucose units, having a glycaemic index greater than 2, and that release a majority of their glucose in greater than 20 minutes upon incubation in pancreatic amylase and amyloglucosidase at 37°C. as described above; and the term "polysaccharide" means a carbohydrate having three or more monomers.

The rapidly absorbed fraction of the carbohydrate component typically comprises about 1 to about 95 weight (wt) % of total carbohydrate component, preferably about 5 to about 85 wt %, and more preferably about 20 to about 75 wt %. When referring herein to the composition of the carbohydrate component, all weight percentages are on a dry weight basis. It is an advantage of the present invention that the rapidly absorbed fraction contains sucrose. Sucrose, in addition to being rapidly absorbed, imparts a sweet taste to the composition thereby increasing palatability. Other disaccharides that may be used as part of the rapidly absorbed fraction are those that contain glucose and thus release glucose upon cleavage of the bond connecting the two monomeric carbohydrate moieties making up the disaccharide. Examples of such disaccharides include, lactose, maltose, galactose, and the like.

The moderately absorbed fraction of the carbohydrate component typically comprises

about 1 to about 95 weight (wt) % of total carbohydrate component, preferably about 5 to about 85 wt %, and more preferably about 20 to about 75 wt %. The monosaccharides and disaccharides that are considered moderately absorbed are non-glucose monosaccharides and non-glucose-containing disaccharides that contribute to blood glucose levels indirectly, i.e., after a metabolic event occurs, e.g., conversion into glucose by the liver. Examples of such moderately absorbed carbohydrates include mannose, fructose, and the like. The moderately absorbed carbohydrate may also be certain polysaccharides that contain glucose units (monomers). Examples of such moderately absorbed carbohydrates include maltodextrins that have a dextrose equivalent of 15 or lower, white flour, wheat flour, certain starches, and the like.

The slowly absorbed fraction of the carbohydrate component typically comprises about 1 to about 95 weight (wt) % of total carbohydrate component, preferably about 5 to about 85 wt %, and more preferably about 20 to about 75 wt %. A suitable slowly absorbed polysaccharides for use herein is raw (uncooked or native) corn starch. In the present invention raw cornstarch is used for the purpose of minimizing blood glucose response instead of the prior art use of preventing hypoglycemia for glycogen storage disease. Other slowly absorbed polysaccharides within the scope of the invention include high amylose corn starch (i.e., an amylose content of greater than 40% by weight), a modified starch which gives a glycaemic index less than 80 (preferably less than 60), most raw cereals, some pastas, and the like. For solid or semi-solid products within the scope of the invention, the slowly absorbed polysaccharide can be any of the aforementioned polysaccharides or mixtures thereof, although the presence of raw corn starch is optional. Examples of such products are Sustained 550 and 735 from National Starch.

Preferred for use herein are carbohydrates wherein the rapidly absorbed fraction is selected from glucose, sucrose, maltose, and mixtures thereof, the moderately absorbed fraction is selected from fructose, mannose, maltodextrin, white flour, wheat flour, and mixtures thereof, and the slowly absorbed fraction is selected from raw corn starch, high amylose corn starch, modified starch, and mixtures thereof.

For such solid or semi-solid products the slowly absorbed polysaccharide preferably comprises high amylose corn starch, modified starch (as described above), or a mixture thereof. A preferred slowly absorbed carbohydrate is Novelose resistant starch which is a high amylose corn starch available from National Starch. For liquid products, raw corn starch is preferred.

Nutritional compositions of the present invention contain proteinaceous material and carbohydrate in a weight ratio of proteinaceous material to carbohydrate greater than 1:1, preferably within the range of from 1.5:1 to 9:1, more preferably within the range of from 1.5:1 to 4:1.

For the purpose of the ratio calculation, the term "proteinaceous material" includes the invention protein hydrolysate from a non-mammalian protein source as well as free amino acids and intact protein material wherein the intact protein material can be derived from both mammalian and non-mammalian sources.

The composition may also comprise one or more optionals selected from intact proteins, free amino acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof.

Intact proteins are proteins that have not been subjected to modifications such as hydrolysis. These include mammalians as well as non-mammalian proteins.

Free amino acids can be incorporated in the invention composition. By "free amino acid", it is meant amino acid per se and which are not provided from indirect sources like proteins.

Typical of minerals, vitamins and other nutrient for use herein include vitamin A, vitamin B6, vitamin B12, vitamin E, vitamin K, vitamin C, vitamin D, inositol, taurine, folic acid, thiamine, riboflavin, niacin, biotin, pantothenic acid, choline, calcium, phosphorous, iodine, iron, magnesium, copper, zinc, manganese, chloride, potassium, sodium, carotenoids, flavonoids, lipoic acid, nucleotides, selenium, chromium, molybdenum, and L-carnitine. Minerals are usually added in salt form.

Typical dietetary fibers include fibers and non-absorbant carbohydrates that have a glycemic index less than 2. The fiber can be soluble, insoluble, fermentable, non-fermentable, or any combination thereof. The fiber can be, for example, soy fiber, pectin, certain resistant starches, oligofructose, inulins, oat fiber, pea fiber, guar gum, gum acacia, modified cellulose, and the like.

The composition of the invention optionally contains one or more flavors including natural or artificial flavorants to enhance palatability such as herbals, spices, flavour ingredient. Any flavorant used in the art can be included such as strawberry; cherry; chocolate; orange; citrus; lemon; grapefruit; coconut; vanilla; spices such as nutmeg, cinnamon and the like.

The fat component can be any lipid or fat known in the art to be suitable for use in nutritional compositions. Typical fats include milk fat, safflower oil, canola oil, egg yolk lipid, olive oil, cotton seed oil, coconut oil, palm oil, palm kernel oil, soybean oil, sunflower oil, fish oil and fractions of all above oils derived thereof such as palm olein, medium chain triglycerides (MCT), and esters of fatty acids wherein the fatty acids are, for example, arachidonic acid, linoleic acid, palmitic acid, stearic acid, docosahexaeonic acid, eicosapentaenoic acid, linolenic acid, oleic acid, lauric acid, capric acid, caprylic acid, caproic acid, and the like. High oleic forms of various oils are also contemplated to be useful herein such as high oleic sunflower oil and high oleic safflower oil.

Preferably the fat level in the compostion is such that less than 40% of the energy in the composition is provided by fat.

C)-Form of the composition

The composition may be in any form suitable for its administration. Preferred forms for the invention nutritional composition are selected from solid product such as a nutritional bar, a cookie, a snack product, a diet product, or liquid product such as a drink product, a diet product or any other food products. Preferably, the nutritional composition is a drink product.

A drink product according to the invention can be prepared by dissolving the above-defined ingredients in an appropriate amount of water. Preferably an isotonic drink has been prepared. For drinks, intended to be used during and after exercise it is recommended to have a concentration of the composition according to the invention in the range of 10-15 wt.% calculated on the total weight of the drink.

D)-Examples

The present invention is illustrated in the non-limiting following examples:

Example 1. Spiced gingerbread

The following is the composition of a spiced gingerbread according to the invention, which ingredients were mixed into a homogeneous batter prior to being baked in an oven for 75 min at 150 °C.

The list of ingredient is as follows:

50 gram wheat gluten
150 gram wheat starch
43 gram fructose
150 gram Sustained 735 (National Starch)
15 gram biscuit spices
10 gram cinnamon
300 ml sugar free fruit syrup
15 gram baking powder
400 ml water
400 gram pea protein hydrolysate Hyprol™ 7102 (Quest International)
300 gram apple pieces

Example 2. Pancakes.

The following is the composition for pancakes and according to the invention. The ingredients were first mixed into a homogeneous batter prior to being baked in a pan.

100 gram wheat gluten
200 gram wheat starch
150 gram fructose
200 gram Sustained 550 (National Starch)
10 gram salt
3300 ml water
550 gram pea protein hydrolysate Hyprol™ 7102 (Quest International) 800 gram eggs

Example 3. Protein drink.

A protein-rich drink was prepared by adding 7 grams per 100 ml of the powder composed out of the following ingredients:

Pea derived Hyprol 7102 Dev	58g
Sucrose	15g
Sustained 550 (National Starch)	20,5g
Citric acid	2,2g
Malic acid	0,8g
Cyclamate	0,54g
Acesulfame-K	0,13g
Aspartame	0,13g
Orange pure delivery flavour QL 27959	1,7g
Neutral cloud pure delivery flavour	0,5g
Tricalcium phosphate	0,5g

CLAIMS

~~1. Use of a proteinaceous material for the manufacture of a composition for~~ preventing and/or treating human obesity, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

2. Use of a proteinaceous material for the manufacture of a composition for reducing in humans the LDL cholesterol concentration and/or reducing triglycerides concentration and/or increasing the HDL cholesterol concentration, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

3. Use of a proteinaceous material for the manufacture of a composition for preventing muscle degradation, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

4. Use of a proteinaceous material for the manufacture of a composition for stimulating the oxidation of fat, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

5. Cosmetic use of a proteinaceous material for stimulating and/or improving body weight reduction in order to improve the human body appearance, wherein the proteinaceous material is a protein hydrolysate obtained from a non-mammalian source.

6. Use according to any one of Claims 1-5, wherein the protein hydrolysate is incorporated in an amount of at least 10% by dry weight of the composition, the composition comprising materials selected from at least one member of the class consisting of carbohydrates, intact proteins, free amino acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof.

7. Use according to any one of Claims 1-6, wherein the protein hydrolysate is incorporated in an amount of at least 10% by dry weight of the composition, the composition comprising a carbohydrate and preferably further comprising materials selected from at least one member of the class consisting of intact proteins, free amino

acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof.

8. Use according to Claim 7, wherein the weight ratio of the proteinaceous material to the carbohydrate is greater than 1:1, preferably within the range of from 1.5:1 to 9:1, more preferably within the range of from 1.5:1 to 4:1.

9. A nutritional composition comprising a protein hydrolysate from a non-mammalian protein source and a carbohydrate wherein the weight ratio of the proteinaceous material to the carbohydrate is greater than 1:1, preferably within the range of from 1.5:1 to 9:1, more preferably within the range of from 1.5:1 to 4:1.

10. A composition according to Claim 9, wherein the composition further comprises materials selected from at least one member of the class consisting of intact proteins, free amino acids, minerals, vitamins, dietary fibers, herbals, spices, flavors, fat, and mixtures thereof.

11. Use according to any one of Claims 1-8 or composition according to either one of Claim 9 or 10, wherein the protein hydrolysate preferably is a protein hydrolysate selected from vegetable protein hydrolysate, fungal protein hydrolysates, microbial protein hydrolysates, fish protein hydrolysates, poultry protein hydrolysates, egg protein hydrolysates and mixtures thereof, most preferably is a vegetable protein hydrolysate obtained from protein selected from wheat, maize, pea, rice, soy, yeast, barley, oats, potato, and mixtures thereof, and even most preferred is a pea protein hydrolysate.

12. Use according to any one of Claims 6-8 or composition according to any one of Claims 9-11, wherein the carbohydrate is selected from at least one member of the class consisting of:

a)-a rapidly absorbed fraction comprising components selected from glucose, sucrose, one or more rapidly absorbed disaccharides containing a glucose unit, and mixtures thereof;

b)- a moderately absorbed fraction comprising components selected from one or more moderately absorbed monosaccharides, disaccharides, glucose-containing polysaccharides, and mixtures thereof;

c)- a slowly absorbed fraction comprising components selected from one or more slowly absorbed glucose-containing polysaccharides.

13. Use or composition according to Claim 12, wherein the rapidly absorbed fraction is selected from glucose, sucrose, maltose, and mixtures thereof, the moderately absorbed fraction is selected from fructose, mannose, maltodextrin, white flour, wheat flour, and mixtures thereof, and the slowly absorbed fraction is selected from raw corn starch, high amylose corn starch, modified starch, and mixtures thereof.

14. Use according to either one of Claim 1, 2, or 4-8 or composition according to any one of Claims 9-13, wherein the composition is a nutritional product, preferably selected from a snack product, a drink product, a diet product, a soup product, preferably a drink product.

ABSTRACT

There is provided the use of a non-mammalian protein hydrolysate for the manufacture of a composition for preventing and/or treating human obesity as well as for improving the lipid metabolism. Also provided herein is the cosmetic use of said proteinaceous material for improving the body appearance. Nutritional compositions are provided which comprise said proteinaceous material and a carbohydrate, wherein the proteinaceous material is present within the composition in an amount higher to that of the amount of carbohydrate.